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Claims

[c1] A method for forming a structure, comprising:
forming a relaxed SiGe block on a substrate; and
forming a strained Si film on a side of the relaxed SiGe block to form a strained channel region.

[c2] The method of claim 1, further comprising forming a gate comprising at least one of an oxide and a high k material on at least one side of the strained Si film.

[c3] The method of claim 2, further comprising removing the relaxed SiGe block to expose a side of the strained Si film and forming a gate comprising at least one of an oxide and a high k material on the exposed side of the strained Si film.

[c4] The method of claim 2, wherein the strained Si film is between about 50 Å and 200 Å thick, and the gate is between about 9 Å and 20 Å thick.

[c5] The method of claim 1, wherein the strained Si film is selectively epitaxially grown.

[c6] The method of claim 1, further comprising forming a first nitride spacer on a top of the relaxed SiGe block and

forming a second nitride spacer on a second side of the relaxed SiGe block and a side of the first nitride spacer.

[c7] The method of claim 1, wherein the strained Si film has a height greater than a thickness.

[c8] The method of claim 1, wherein the SiGe block is formed by forming a relaxed SiGe layer on the substrate and etching away portions of the relaxed SiGe layer to form the relaxed SiGe block.

[c9] The method of claim 1, further comprising:
forming a thin oxide layer over the relaxed SiGe layer;
forming a polysilicon layer over the thin oxide layer;
forming a photoresist on a portion of the polysilicon layer; and
etching away an exposed portion of the polysilicon layer, and a portion of the oxide layer to expose a portion of the relaxed SiGe layer; and
forming a first nitride spacer on a top portion of the relaxed SiGe layer adjacent to an edge of the thin oxide layer and the polysilicon layer.

[c10] The method of claim 9, further comprising:
etching an exposed portion of the relaxed SiGe layer to expose a portion of the substrate;
forming a second nitride spacer on the exposed sub-

strate adjacent an edge of the relaxed SiGe layer and first nitride spacer; and

etching away remaining portions of the polysilicon layer, the thin oxide layer and a portion of the relaxed SiGe layer underlying the thin oxide layer to form the relaxed SiGe block with the first and second nitride spacers.

[c11] A method, comprising:

forming a relaxed SiGe block on an oxide substrate;

forming a first nitride spacer on a first portion of the relaxed SiGe block;

forming a second nitride spacer on the oxide substrate adjacent another portion of the relaxed SiGe block and a portion of the first nitride spacer; and

epitaxially forming a strained Si film on an exposed side of the relaxed SiGe block.

[c12] The method of claim 11, wherein the strained Si film has a height greater than a thickness.

[c13] The method of claim 12, wherein the strained Si film forms a fin of strained Si film vertically oriented on the oxide substrate.

[c14] The method of claim 12, further comprising forming a gate comprising at least one of an oxide and a high k material on a first surface of the strained Si film opposite

the SiGe block.

[c15] The method of claim 18, wherein the strained Si film is at a height substantially equal to a height of the SiGe block.

[c16] The method of claim 15, further comprising:
forming a gate comprising at least one of an oxide and a high k material on a top of the strained Si film;
removing the first and second nitride spacers;
removing the SiGe block to expose a second side of the strained Si film; and
forming a gate comprising at least one of an oxide and a high k material on a second side of the strained Si film.

[c17] A semiconductor structure, comprising:
a channel having a fin of strained Si vertically oriented on a non-conductive substrate.

[c18] The structure of claim 17, wherein the strained Si film is between about 50 Å and 200 Å thick.

[c19] The structure of claim 17, wherein the strained Si film is epitaxially grown on a block of relaxed SiGe, wherein the relaxed SiGe comprises a range of Ge ranging from about 0% to about 100%.

[c20] The structure of claim 17, further comprising a gate comprising at least one of an oxide and a high k material

formed on a first side of the strained Si film.

[c21] The structure of claim 20, further comprising a gate comprising at least one of an oxide and a high k material formed on a top and a second side of the strained Si film.

[c22] The structure of claim 20, wherein the Si film is a low defect strained Si fin.